

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Satoru MIYANO, et al.

Serial Number: 10/722,033

Filing Date: November 25, 2003

Title: INFERRING GENE REGULATORY
NETWORKS FROM TIME-ORDERED
GENE EXPRESSION DATA USING
DIFFERENTIAL EQUATIONS

Group Art Unit: 1631

Examiner: Pablo S. Whaley

CONFIRMATION NO: 6506

FILED ELECTRONICALLY ON: February 14, 2007

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §1.97

Sir:

Applicants hereby submit an Information Disclosure Statement along with attached form PTO/SB/08. A copy of each listed publication is submitted, if required, pursuant to 37 CFR §§1.97-1.98, as indicated below.

Applicants respectfully request that the listed information be considered by the Examiner and be made of record in the above-identified application. Applicants further request that the Examiner initial and return the attached form PTO/SB/08 in accordance with MPEP §609.

Applicants reserve the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement is not intended to represent that a search has been made or that the information cited in the statement is, or is considered to be, prior art or material to patentability as defined in §1.56.

- A. ☐ 37 CFR §1.97(b). This Information Disclosure Statement should be considered by the Office because:
- ☐ (1) It is being filed within 3 months of the filing date of a national application and is other than a continued prosecution application under §1.53(d);
-- OR --
 - ☐ (2) It is being filed within 3 months of entry of the national stage as set forth in §1.491 in an international application;
-- OR --
 - ☐ (3) It is being filed before the mailing of a first Office action on the merits;
-- OR --
 - ☐ (4) It is being filed before the mailing of a first Office action after the filing of a request for continued examination under §1.114.
- B. ☒ 37 CFR §1.97(c). Although this Information Disclosure Statement is being filed after the period specified in 37 CFR §1.97(b), above, it is filed before the mailing date of the earlier of (1) a final office action under §1.113, (2) a notice of allowance under §1.311, or (3) an action that otherwise closes prosecution on the merits, this Information Disclosure Statement should be considered because it is accompanied by one of:
- ☐ a statement as specified in §1.97(e) provided concurrently herewith;
-- OR --
 - ☒ a fee of \$180.00 as set forth in §1.17(p) authorized below, enclosed, or included with the payment of other papers filed together with this statement.
- C. ☐ 37 CFR §1.97(d). Although this Information Disclosure Statement is being filed after the mailing date of the earlier of (1) a final office action under §1.113 or (2) a notice of allowance under §1.311, it is being filed before payment of the issue fee and should be considered because it is accompanied by:
- i. a statement as specified in §1.97(e);
-- AND --
 - ii. a fee of \$180.00 as set forth in §1.17(p) is authorized below, enclosed, or included with the payment of other papers filed together with this Statement.
- D. ☐ 37 CFR §1.97(e). Statement.
- ☐ A statement is provided herewith to satisfy the requirement under 37 CFR §§1.97(c);
-- AND/OR --
 - ☐ A statement is provided herewith to satisfy the requirement under 37 CFR §§1.97(d);
-- AND/OR --
 - ☐ A copy of a dated communication from a foreign patent office clearly showing that the information disclosure statement is being submitted within 3 months of the filing date on the communication is provided in lieu of a statement under 37 C.F.R. § 1.97(e)(1) as provided for under MPEP 609.04(b) V.
- E. ☐ Statement Under 37 C.F.R. §1.704(d). Each item of information contained in the information disclosure statement was first cited in a communication from a foreign patent office in a counterpart application that was received by an individual designated in § 1.56(c) not more than thirty (30) days prior to the filing of this information disclosure statement. This statement is made pursuant to the

requirements of 37 C.F.R. §1.704(d) to avoid reduction of the period of adjustment of the patent term for Applicant(s) delay.

F. ☒ 37 CFR §1.98(a)(2). The content of the Information Disclosure Statement is as follows:

☐ Copies of each of the references listed on the attached Form PTO/SB/08 are enclosed herewith.

-- OR --

☐ Copies of U.S. Patent Documents (issued patents and patent publications) listed on the attached Form PTO/SB/08 are NOT enclosed.

-- AND/OR --

☒ Copies of Foreign Patent Documents and/or Non Patent Literature Documents listed on the attached Form PTO/SB/08 are enclosed in accordance with 37 CFR §1.98 (a)(2).

-- AND/OR --

☐ Copies of pending unpublished U.S. patent applications are enclosed in accordance with 37 CFR §1.98(a)(2)(iii).

G. ☐ 37 CFR §1.98(a)(3). The Information Disclosure Statement includes non-English patents and/or references.

☐ Pursuant to 37 CFR §1.98(a)(3)(i), a concise explanation of the relevance of each patent, publication or other information provided that is not in English is provided herewith.

☐ Pursuant to MPEP 609(B), an English language copy of a foreign search report is submitted herewith to satisfy the requirement for a concise explanation where non-English language information is cited in the search report.

-- OR --

☐ A concise explanation of the relevance of each patent, publication or other information provided that is not in English is as follows: _____

☐ Pursuant to 37 CFR §1.98(a)(3)(ii), a copy of a translation, or a portion thereof, of the non-English language reference(s) is provided herewith.

H. ☐ 37 CFR §1.98(d). Copies of patents, publications and pending U.S. patent applications, or other information specified in 37 C.F.R. § 1.98(a) are not provided herewith because:

☐ Pursuant to 37 CFR §1.98(d)(1) the information was previously submitted in an Information Disclosure Statement for another application under which this application claims priority for an earlier effective filing date under 35 U.S.C. 120.

Application in which the information was submitted: _____

Information Disclosure Statement(s) filed on: _____

AND

☐ The information disclosure statement submitted in the earlier application complied with paragraphs (a) through (c) of 37 CFR §1.98.

- I. ☒ *Fee Authorization.* The Commissioner is hereby authorized to charge the above-referenced fees of \$180.00 and charge any additional fees or credit any overpayment associated with this communication to Deposit Account No. 23-2415 (Docket No. 34569-701.201).

Respectfully submitted,

WILSON SONSINI GOODRICH & ROSATI

Dated: February 14, 2007

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By: 

Samir Elamrani, Reg. No. 43,601

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Substitute for form 1449/PTO			Complete if Known		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)			Application Number	10/722,033	
			Filing Date	November 25, 2003	
			First Named Inventor	Satoru Miyano	
			Art Unit	1631	
			Examiner Name	Pablo S. Whaley	
Sheet	1	Of	2	Attorney Docket Number	34569-701.201

NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		T ⁴
	1.	AKAIKE, H. A new look at the statistical model identification. (Originally published in IEEE Trans. Automat. Contr. 1974; 19:716-723.)		
	2.	AKAIKE, H. Information theory and an extension of the maximum likelihood principle. (Originally published in B.N. Petrov and F. Csaki (editors), 2nd Int. Symp. on Inf. Theory. Akadémiai Kiadó, Budapest. 1973; 267-281.)		
	3.	ANDERSON, et al. eds. The New Statistical Analysis of Data. Springer Verlag, New York. 1996. (Table of Contents only.)		
	4.	DERISI, et al. Exploring the metabolic and genetic control of gene expression on a genomic scale. Science. 1997; 278(24):680-686.		
	5.	EISEN, et al. Cluster analysis and display of genome-wide expression patterns. Proc. Natl. Acad. Sci. USA. 1998; 95:14863-14868.		
	6.	FRIEDMAN, et al. Using Bayesian networks to analyze expression data. J. Comp. Biol. 2000; 7:601-620.		
	7.	HIHARA, et al. DNA microarray analysis of cyanobacterial gene expression during acclimation to high light. The Plant Cell. 2001; 13:793-806.		
	8.	HOON, et al. Statistical analysis of a small set of time-ordered gene expression data using linear splines. Bioinformatics. 2002; 18:1477-1485.		
	9.	HORN, et al. Eds. Matrix Analysis. Cambridge University Press, Cambridge, UK. 1999. (Table of Contents only)		
	10.	IMOTO, et al. Bayesian network and nonparametric heteroscedastic regression for nonlinear modeling of genetic network. Proc. IEEE Computer Society Bioinformatics Conference. 2002; 219-227.		

Examiner Signature	Date Considered
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPF 400. Draw line through citation if not in conformance and not considered. Include copy of the form with most correspondence to applicant. *Applicant's unique citation designation number (optional). *See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPF 001.04. *Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). *For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. *Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. *Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND PRESS OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Counselor for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449/PTO				Complete if Known	
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				Filing Date	November 25, 2003
				First Named Inventor	Satoru Miyano
				Art Unit	1631
				Examiner Name	Pablo S. Whaley
Sheet	2	Of	2	Attorney Docket Number	34569-701.201

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Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁶	
	11.	IMOTO, et al. Estimation of genetic networks and functional structures between genes by using Bayesian networks and nonparametric regression. Pac. Symp. on Biocomputing. 2002; 7:175-186.		
	12.	LIANG, et al. REVEAL, a general reverse engineering algorithm for inference of genetic network architectures. Pac. Symp. on Biocomputing. 1998; 3:18-29.		
	13.	MATSUNO, et al. XML documentation of biopathways and their simulation in Genomic Object Net. Genome Informatics. 2001; 12:54-62.		
	14.	MOSZER, et al. Subtilist: the reference database for the Bacillus subtilis genome. Nucleic Acids Research. 2002; 30(1):62-65.		
	15.	MOSZER, I. The complete genome of Bacillus subtilis: From sequence annotation to data management and analysis. FEBS Letters. 1998; 430:28-36.		
	16.	PRIESTLEY, M. B. Spectral Analysis and Time Series. Academic Press, London. 1994. (Table of Contents only.)		
	17.	SAKAMOTO, et al. Evolutionary inference of a biological network as differential equations by genetic programming. Genome Informatics. 2001; 12:276-277.		
	18.	SPELLMAN, et al. Comprehensive identification of cell cycle-regulated genes of the yeast Saccharomyces cerevisiae by microarray hybridization. Mol. Biol. Cell. 1998; 9:3273-3297.		
	19.	TAMAYO, et al. Interpreting patterns of gene expression with self-organizing maps: Methods and application to hematopoietic differentiation. Proc. Natl. Acad. Sci. USA. 1999; 96:2907-02912.		

Examiner Signature	Date Considered
<p>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. *Applicant's unique citation designation number (optional). *See Kinda Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. *Enter Office that issued the document, by the two-letter code (WIPO Standard ST 3). *For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. *Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST 16 if possible. *Applicant is to place a check mark here if English language translation is attached.</p> <p>This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.</p> <p>If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.</p>	